

January 15, 2019

Ms. Wanda Joy
Territorial Environmental Health Specialist
Government of Canada
Department of Health
PO Box 1000, Station 1000
Iqaluit, Nunavut X0A 0H0

O/Ref.: QE18-166-2

Subject: Indoor Air Quality Testing at the Northmart Grocery Store located in Iqaluit, Nunavut – REPORT

Dear Ms. Joy:

Qikiqtaaluk Environmental Inc. (QE) is pleased to present the following report regarding the indoor air quality testing that was conducted at the above-mentioned property (hereinafter referred to as the “Site”).

➤ **Context**

On November 19, 2018, QE received written authorization to perform an indoor air quality survey at the Site. The request was made following a fire that took place at the southern part of the property. The results of the IAQ¹ testing, performed by **23.1** Environmental Technician with QE, are presented below.

➤ **Objectives**

The objectives of the IAQ inspection were:

- To assess the IAQ at the Northmart Store by measuring for Total VOCs² and particulates during a normal occupancy day;
- To recommend solutions based on results identified during the IAQ study.

➤ **Scope of Work**

The scope of work to meet the above project objectives included:

- Performing IAQ measurements using direct reading instruments; and,
- Reporting of the results.

1 Indoor air quality
2 Volatile organic compounds

➤ Fieldwork and Methodology

QE selected 8 indoor sampling locations for Total VOCs and particulates. Five were located within the main floor retail area, and 3 locations were selected on the second-floor staff area and stairway. The outdoor sample was collected just outside the building entrance. There was a total of 9 sampling locations.

Sampling locations are presented in Table 1 hereinafter.

➤ Results

Spore trap analysis results for the Site are presented in Table 1, below.

TABLE 1
Air Quality Testing Results

Floor/s	Sample Location	Aerosol (Peak) mg/m ³	Aerosol (Mean) mg/m ³	VOCs (Peak) ppb	VOCs (Mean) ppb
1	Western Union / East corner	0.163	0.046	466	271
1	South Corner	0.170	0.040	439	355
1	West Corner	0.037	0.008	450	323
1	Tim Hortons / North Corner	0.068	0.030	293	172
1	Aisle 9 / Middle Floor	0.056	0.015	389	230
1	Staff Lounge	0.051	0.010	309	154
1	Corridor	0.078	0.019	345	98
1 and 2	Stairway	0.093	0.042	320	176
O	Outdoors	0.135	0.035	0	0

➤ Observations and Discussion

A direct reading device, TSI DustTrak™, was used to measure fine airborne particulate levels with an aerodynamic diameter of < 10 µm. Another direct reading device, ppbRae 3000, was used to measure for total VOCs in the air. At each location, a measurement was taken once the readings had stabilized. Measurements were taken at an approximate height of 1.5 m from the floor¹ (breathing height). The air measurement results are presented as an average of all the instant values (Mean) collected over a minimum of a 2-minute period at each measurement point. The highest of the instant values (Peak) is also indicated in the table above.

¹ Sampling height from the floor was occasionally adjusted to better capture specific areas of concern.

As per aerosols, the Guideline¹ level is 0.15 mg/m³ in average for 24 hours of exposure. One may begin to feel discomfort at 50% of this guideline thus 0.075mg/m³ of air on average. The results from all sampling periods indicate that the average indoor aerosol concentrations in all areas measured respected the guideline levels for IAQ, as set by the USEPA². On the days the measurements were taken, outdoor conditions were cold and dry. In general, aerosol concentrations in indoor spaces vary significantly, depending on the number of occupants in the area, type of flooring, cleaning schedules, and other factors that may agitate settled dust. A consistent reading of greater than 0.075 mg/m³ may be a cause for concern requiring corrective action. The average aerosol concentrations were below that level at the time of the study.

Regarding Total VOCs, there are no defined guidelines. However, Health Canada's *Technical Guide for Indoor Air Quality in Office Buildings* (1995) refers to a target unit of 436 ppb³ for an average exposure over 24 hours.

At the time of sampling, all measurements were below both guidelines with regard to the average concentrations for 24 hours of exposure. Understandably the South Corner and West Corner samples, taken close to the back-store wall where the fire occurred, presented the highest VOC readings. It's also important to note that these measurements were taken only once; therefore a statistical analysis cannot be calculated.

➤ Conclusions and Recommendations

The IAQ study revealed that the parameters (VOCs and aerosols) measured during the sampling periods **meet the guidelines** set by the various authorities having jurisdiction and industry standards where no guideline values exist. It should also be noted that the store's owner and operator, the Northwest Company, requested an in-depth IAQ study to be conducted by QE to measure for specific contaminants in the air according to Health Canada's Indoor Air Reference Levels for Chronic Exposure to Volatile Organic Compounds that are most likely to result from a building fire event. Results of that second study are still pending at the time of presenting this report.

Should you require additional information, please do not hesitate to contact us.

Best regards,

23.1

Project Director – Northern Projects

JG/AL/cm

23.1

Project Manager – Northern Projects

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1 There is no Canadian standard for this parameter. The standard from USEPA's *National Ambient Air Quality Standards* was used.

2 United States Environmental Protection Agency

3 Parts per billion

4 *Ordre des ingénieurs du Québec* (Quebec Order of Licensed Engineers)